

REMARKS

Claims 1, 3-10, 13-18, 32, 35, 36, 39, 40, 42-44, 46, and 47 are pending in this application. Claims 2, 11, 12, 29-31, 33, 34, 37, 38, 41, 45, and 48 were previously canceled and claims 19-28 are canceled herein. Claims 1, 6, 32, and 44 have been amended herein. In view of these amendments and remarks, Applicant respectfully requests reconsideration of the claims.

The Examiner has rejected claims 1, 3-10, 13, 28, 32, 35, 36, 39, 40, 42-44, 46, and 47 under 35 U.S.C. 102(e) as being clearly anticipated by Yan or Miyatake. The Examiner then states that the two references teach depositing a layer of material having "the same index of refraction of the material that it is deposited on and the removal of a region in a layer to achieve the appropriate thickness, in order to give the desired phase shift". While this statement by the Examiner may use terms and phraseology broad enough to include both some of the embodiments of the invention and the teachings of the Miyatake reference, the Examiner's condensed summary of the two references does not constitute a 35 U.S.C. 102(e) anticipating reference. Further, neither of the references anticipate the claims of the invention. More specifically, as is discussed below in detail, it is very clear that neither Miyatake or Yan even suggest or mention all of the elements of the present claims, much less the unique combination of elements in the claims.

Miyatake certainly does not sufficiently teach the invention to anticipate every element of the claims as required for a rejection under 35 U.S.C. 102(e), and it is also submitted that the Yan reference has even greater difficulties and is not properly summarized under the Examiner's broad statement. However, even if Yan was properly summarized, it still would not anticipate the invention. More specifically, Yan does not deposit a layer of material having "the same

index of refraction of the material that it is deposited on” as alleged by the Examiner. The deposited or repair material 304 of Yan is the same material as the opaque layer 204 (i.e., Ti, TiN, or Mo), and is deposited on a buffer layer 202 (of SiO₂). Also, of course, the SiO₂ buffer layer 202 does not have the same index of refraction as the substrate 200 (i.e., glass or quartz) that it is deposited on. Thus, the Examiner’s statement is clearly incorrect.

With respect to the Examiner’s more detailed discussion of Yan, the Examiner describes Yan’s process for *fabricating* a photomask formed of two different thin film layers (a buffer layer and a substantially opaque layer) on top of a substrate. However, Yan’s process for fabrication is not a process for repairing a defect. The present invention describes and the claims cover a method of repairing defects (primarily clear defects, but could be used for other types of defects—see last sentence of paragraph 0028), yet with respect to repairing defects, the Examiner simply states that in addition to disclosing a method of fabricating a photomask, Yan further comprises inspecting the film pattern after etching the second or top film (i.e., the substantially opaque film) for left over defects; and then removing and filling the left over defects using the first film as an etch stop buffer. This statement by the Examiner of how Yan repairs a defect is certainly not even a general description of, much less anticipatory of, the Applicant’s claim language.

Therefore, Applicant submits that not only does Yan not anticipate the present claims, the Examiner has made no attempt to show how he considers the present claim 1 reads on Yan.

For example, as stated above, the preamble of claim 1 clearly defines a *clear* defect that is to be repaired (i.e., an absence of the substantially opaque material 14 in areas it should be present). The claim then recites that this *clear* defect is repaired by specific defined steps of identifying, modifying, and depositing.

The first element of the claims of the present invention for repairing the mask that is listed after the preamble is to "identify the location of the defect". Applicant will concede that Yan does identify the location of the defect. However, claim 1 of the present invention then requires two specific combinations of process steps that Yan does not even suggest, much less teach. For example, Yan does not modify the first thickness of the substrate or first layer to a selected second thickness by either removing material (the illustrated embodiment) or adding material having the same index of refraction (IR) to introduce a pre-selected phase change in light that passes through the area with the defect. There is absolutely no suggestion, much less such a teaching in Yan. Yan does teach completely removing the buffer layer 202 to pattern the mask, but in light of the specification and the remainder of the claims of the present invention, completely removing the buffer layers cannot reasonably be considered the same as modifying a first thickness to a selected second thickness as required by the present invention. If the buffer layer is completely removed, there is no layer having a selected second thickness that remains.

Likewise, Yan does not then deposit a material having a pre-selected index of refraction over the modified area of the substrate such that light passing through the selected thickness of the deposited material and the modified or second thickness of the first layer has a phase shift substantially equal to the "selected phase shift" caused by an intact layer of the second (the substantially opaque) material and the original or first thickness of the first layer or substrate. Therefore, it is respectfully submitted that independent claim 1 clearly patently defines over the Yan reference.

With respect to the Miyatake reference, the Examiner alleges that this reference also anticipates claim 1 of the present invention. The Examiner then describes in detail the steps of Miyatake for repairing defects. However, rather than illustrating the anticipation of the present

claims of the invention by Miyatake, the described detailed steps clearly illustrate a process that is different from the claimed invention.

Specifically, Miyatake does teach depositing a layer of material over the area containing a defect that is the same as the first layer or substrate. Therefore, Miyatake can reasonably be said to modify the thickness of the substrate or first layer by adding material. However, Miyatake does not disclose modifying the thickness by removing material as is clearly required by claims 3, 13, and 15-17.

Finally, Miyatake clearly does not in any way teach or suggest the last element of independent claim 1 or the penultimate element of independent claim 32, of depositing a "repair material" different than the substrate or first layer over the modified area of the first layer such that light passing through the deposited material at the selected thickness and the modified thickness of the first layer or substrate has a phase shift substantially equal to the "selected phase shift" of an intact first and second layer.

Miyatake does repair both black and white defect areas, but certainly not in the same manner as taught and claimed by the present application. In addition, a "white" defect where the substantially transparent *substrate or first layer* is pitted or otherwise has portions removed, as illustrated by Miyatake, is not the same kind of defect as a "clear" defect where a portion of the substantially opaque material is missing as illustrated by the present invention. Miyatake does not even teach repairing a hole or unintended opening in the substantially opaque material 3 such that light passing through the repaired area has the same phase shift as light passing through the substantially opaque patterned mask 3 and the intact substrate or first layer when compared to the phase of light passing only through the transparent substrate. Therefore, it is clear that independent claim 1 also patentably defines over the Miyatake reference.

All of the original dependent claims remaining in the application depend from claim 1. Therefore, these claims are also allowable for depending from a dependent claim as well as for their own limitations.

In view of the above, Applicant respectfully submits that the application is in condition for allowance and requests that the Examiner pass the case to issuance. If the Examiner should have any questions, Applicant requests that the Examiner contact Applicant's attorney at 972-732-1001 so that such issues may be resolved as expeditiously as possible. No fee is believed due in connection with this filing. However, should one be deemed due, the Commissioner is hereby authorized to charge the appropriate fees to Deposit Account No. 50-1065.

Respectfully submitted,

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Date

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